Microsoft

.net developer training

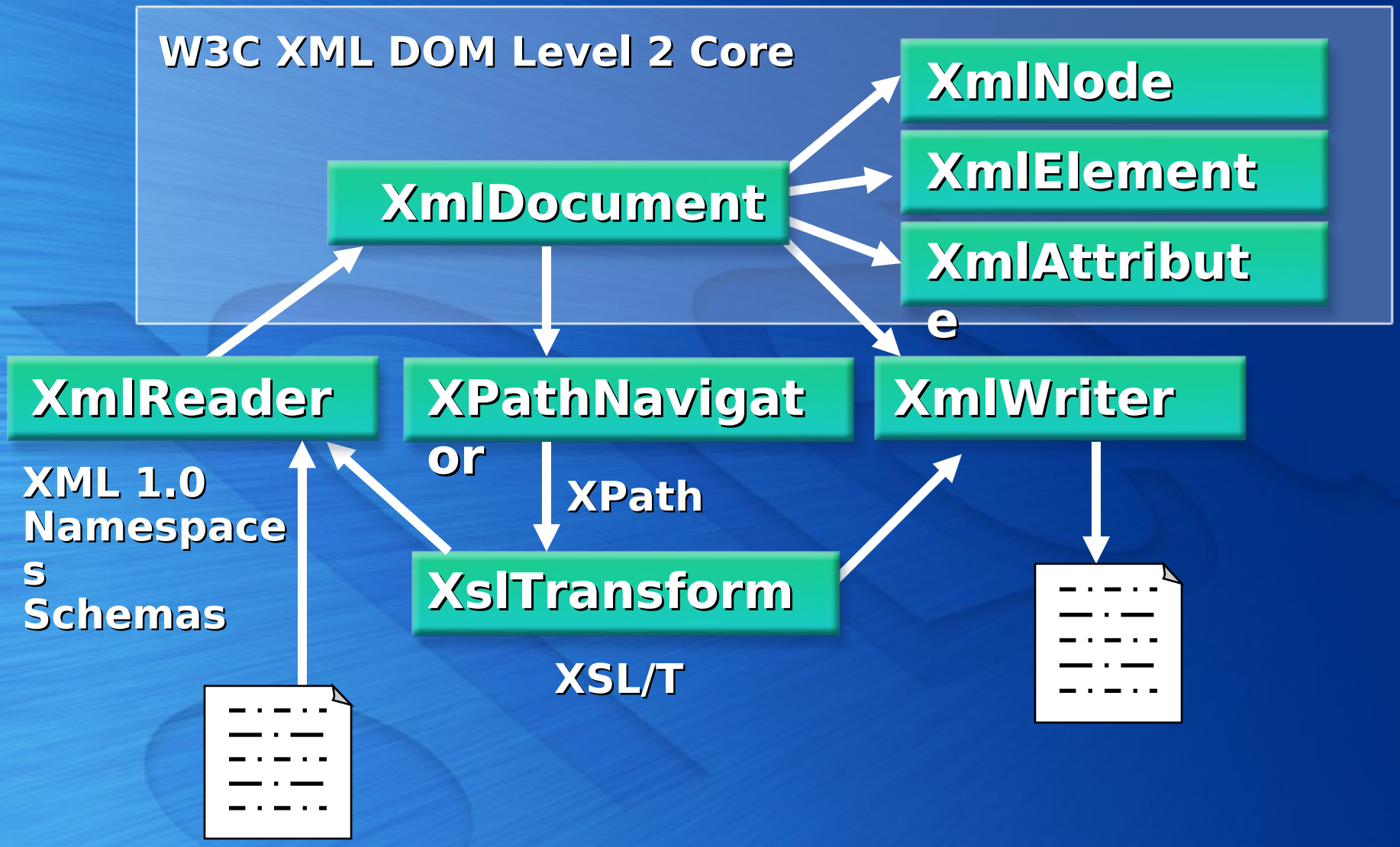
Create XML Web Services and Applications with Visual Studio .NET

Using XML in .NET

Module 08: Agenda

- Parsing XML
  - XmlReader and XmlWriter
  - XML document
- Navigating XML
  - XPathNavigator
- Data and XML
  - Managed Data Overview
  - ADO.NET and XML
  - Accessing XML documents as relational data
  - Accessing relational data as XML

XML .NET Architecture



XmlReader and XmlWriter

- XmlReader
  - Pull model interface
  - Cursor over forward only stream
  - Parse time validation
  - XmlTextReader, XmlNodeReader Implementations
- XmlWriter
  - Helps generate well formed XML output
  - Helps with namespaces
  - XmlTextWriter implementation

XmlReader

Demo

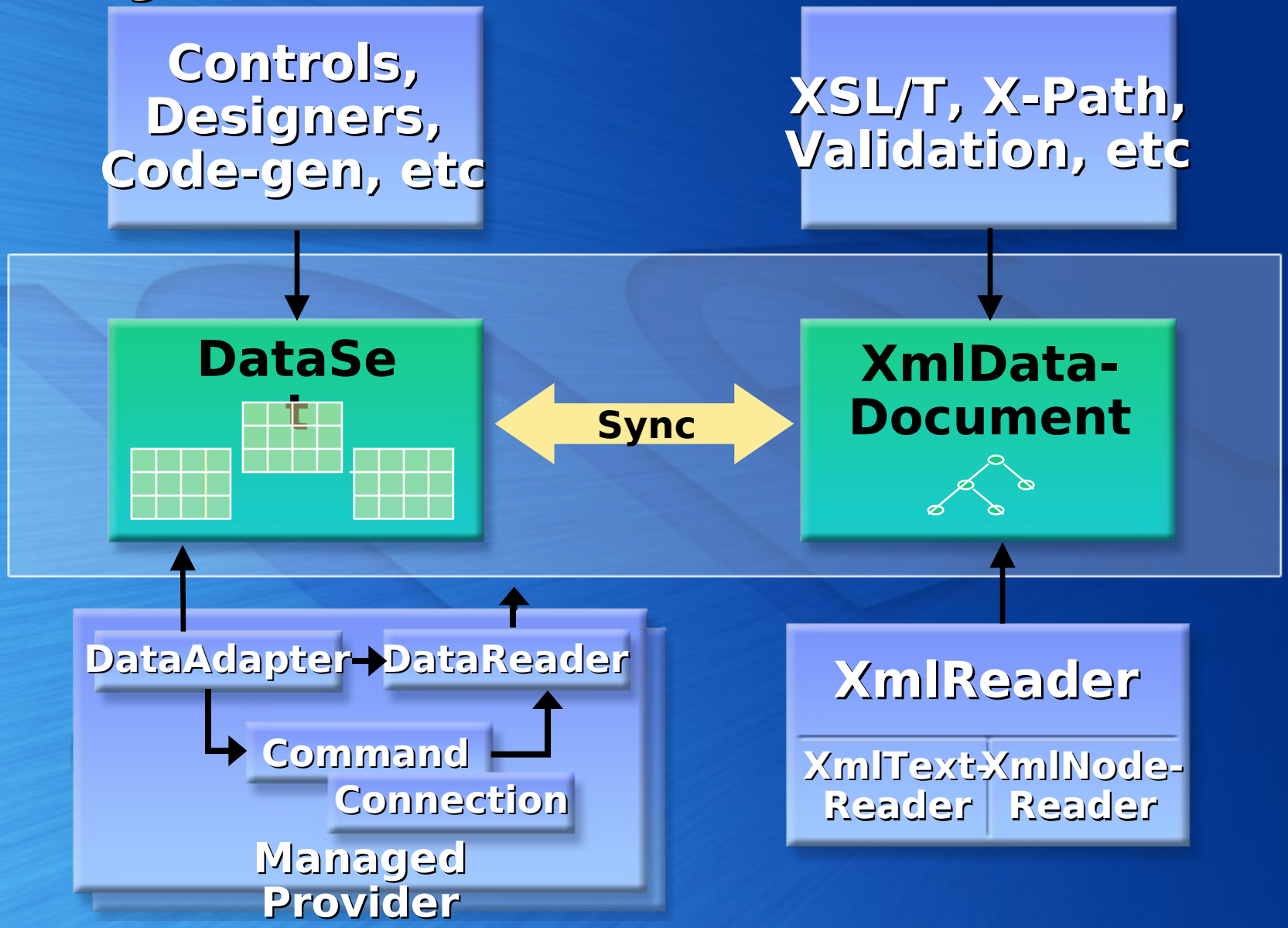
- XmlReader
- Show reading XML from URL

XMLDocument

- Additional functionality – Load(), Save() and event handling
- InnerXML properties build a subtree for you

```
node.InnerXML =
"<Person><Name>Mark</Name><Email>mfussell@microsoft.com</Email></Person>”
```

Data and XML
Managed Data Overview



ADO.NET and XML

- Natural evolution of ADO and MSXML
- Fully integrated
- DataSet and XmlDataDocument are key components
- An XML data set can be presented as an XML document and vice versa

ADO.NET and XML

- DataSet
  - Loads/saves XML data into/out of DataSet
  - Schema can be loaded/saved as XSD
  - Schema can be inferred from XML Data
- DataSet with XmlDataDocument
  - Exposes relational view over structured XML
    - According to the DataSet Schema
  - Allows strong typing, control binding and relational access of XML data
  - Allows XML tools (schema validation, XSL/T, XPath queries) against relational data

DataSet with XML Sources

- Load DataSet with XML
  - ReadXML method (and more)
  - Open as relational data
- Saving DataSet as XML
  - WriteXML method

Schema Inference

- Schema can be inferred from data
  - When no schema is defined when you call DataSet.ReadXML()
- General rules
  - Element becomes table if:
    - It repeats or contains more than simple content
    - Otherwise, it becomes column
  - Attributes become columns
  - Relations are created for nested table-mapped elements
- Useful for ad hoc binding to data
  - Schema depends on data instance

Mapping XML To Relational

Customers Table

Nested Orders Table

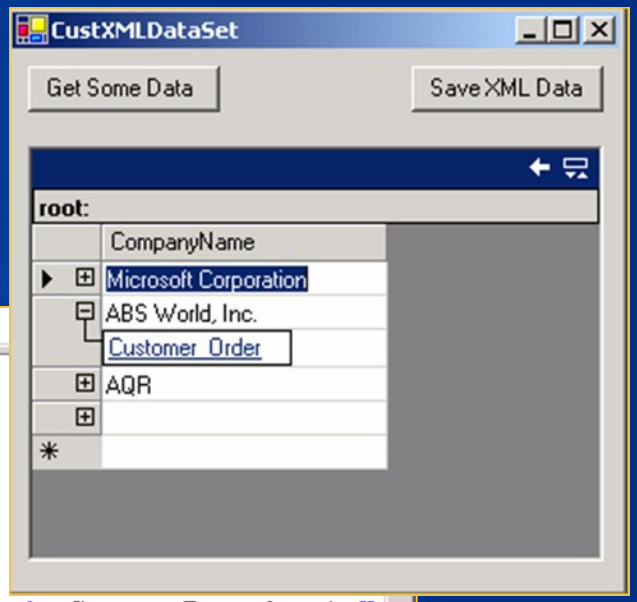
```
<Customers CustomerID="GREAL">
  <Orders>
        <OrderID>10528</OrderID>
        <OrderDetails>
              <ProductID>11</ProductID>
              <UnitPrice>21</UnitPrice>
              <Quantity>3</Quantity>
        </OrderDetails>
        <OrderDate>1997-05-
  06T00:00:00.0000</OrderDate>
  </Orders>
  <ContactName>Howard Snyder</ContactName>
  <Address>2732 Baker Blvd.</Address>
  <City>Eugene</City>
  <Region>OR</Region>
  <PostalCode>97403</PostalCode>
</Customers>
```

Products Table

```
<Products ProductID="33">Geitost</Products>
<Products ProductID="11">Queso
  Cabrales</Products>
<Products ProductID="35">Steeleye
```

XML and DataSets
Demo

- XML and DataSets



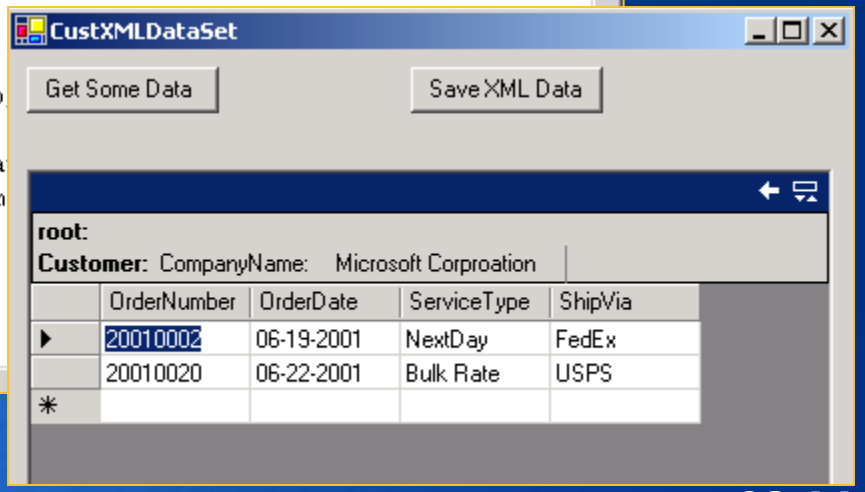
CustXMLDataSet (_09XMLDataSet) | Button1_Click

```
Imports System.Data
Imports System.Data.OleDb
Public Class CustXMLDataSet
    Inherits System.Windows.Forms.Form
                    Class Form
 Windows Form Designer generated code

    Private Sub Button1_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Ha
        Dim CustXMLDataSet As New DataSet("XMLDataSet")
        CustXMLDataSet.ReadXml("C:\Temp\xmlCustomer.xml")   ' be sure to use the correct path

        DataGrid1.DataSource = CustXMLDataSet
    End Sub

    Private Sub Button2_Click(ByVal sender As System.Ob
        Dim CustXMLDataSet As DataSet
        CustXMLDataSet = CType(DataGrid1.DataSource, Da
        CustXMLDataSet.WriteXml("C:\Temp\xmlCustomer.xm
    End Sub
End Class
```



XML Relational Data

- XmlDataDocument
  - SQL XML
    - XML streamed from SQL Server™
    - Support for UpdateGrams

XmlDataDocument

- A DataSet can be associated with an XMLDataDocument
  - Exposes a relational view over structured XML
  - Preserves full fidelity of XML document
  - Simultaneously exposes data relationally or as XML
    - Semi-structured data
    - Multiple tools on same data synchronized hierarchical/relational view
- Mapping is based on W3C XSD schemas
- Provides efficient connection of relational data to XslTransform

Summary

- .NET and XML
  - Objects and features make working with XML easy
  - XML is used under the hood by many objects (such as the DataSet)
  - DataSet provides relational view
    - Persists/loads data as XML
    - Persists/loads schema as XSD
    - Serializes as XML with in-line schema
  - XmlDataDocument provides an XML view
    - Exposes relational data to XML tools
    - Exposes a relational subset of XML data
    - Preserves fidelity of XML

Resources

- The Extensible Markup Language (XML) is the universal format for structured documents and data on the Web; for more information: http://www.w3.org/xml/

In-Depth Training on XML
Direct from Microsoft

- 2500A: Introduction to XML and the Microsoft .NET Platform
- 2503A: Programming with XML in the Microsoft .NET Framework
  - Availability Date to be Decided

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